

What is claimed is:

1. An automated device for collecting samples of breath expired from a subject
- 5 comprising:
 - an inlet for a breath sample;
 - a breath collection vessel connected to the inlet; and
 - a microprocessor associated with the inlet and breath collection vessel capable
 - 10 of automatically directing the breath sample to the breath collection vessel.
2. The device of claim 1, wherein the device is sized and shaped so as to be portable.
3. The device of claim 1, further comprising a valve associated with the breath collection vessel.
- 15 4. The device of claim 3, further comprising a valve manifold.
5. The device of claim 4, further comprising a plurality of breath collection vessels connected to the valve manifold.
6. The device of claim 1, further comprising a communication element.
- 20 7. The device of claim 6, wherein the communication element is a speaker.
8. The device of claim 7, wherein verbal breath collection procedure instructions capable of being transmitted through the speaker are stored in the microprocessor.
9. The device of claim 1, further comprising a breath capture mask associated with
- 25 the breath sample inlet.
10. The device of 1, further comprising a nasal canula associated with the breath sample inlet.

11. The device of claim 1, further comprising a nitrogen gas supply associated with the breath sample inlet.

12. An automated breath collection device comprising;

a breath inlet;

5 a breath sample reservoir connected to the breath inlet;

a breath sample collection vessel connected to the breath sample reservoir;

a valve associated with the breath sample reservoir and breath sample collection vessel; and

a microprocessor associated with the breath collection vessel and the breath
10 reservoir capable of opening the valve to automatically direct the breath sample from the breath reservoir to the breath collection vessel.

13. The device of claim 12, further comprising an exhaust valve connected to the breath sample reservoir.

14. The device of claim 12, further comprising a plurality of breath sample collection

15 vessels and a plurality of valves, wherein each valve connects the breath sample reservoir to one of the breath sample collection vessels.

15. The device of claim 14, wherein the microprocessor is capable of sequentially opening the valves to deliver breath sample from the breath sample reservoir to one of the breath sample collection vessels.

20 16. The device of claim 12, further comprising a communication element associated with the microprocessor and wherein the microprocessor is capable of directing a subject to breath into the breath inlet according to a desired a breath collection procedure through the communication element.

17. The device of claim 12, further comprising a cartridge capable of holding the breath collection vessels.

18. The device of claim 17, wherein the cartridge comprises a machine readable code positioned on the cartridge so that when the cartridge is inserted into the device,

5 the code is aligned with a code reading element associated with the microprocessor and wherein the code when read will activate the device to perform a preprogrammed breath collection procedure.

19. A method of collecting breath samples comprising the steps of;

having a subject breath into a breath collection device through an inlet until a

10 desired amount of breath has been introduced into a breath sample reservoir; and

automatically conveying the breath exhaled from the subject from the breath sample reservoir to an airtight breath sample collection vessel.

20. The method of claim 19, wherein the breath collection device includes a communication element through which verbal instructions may be delivered and the

15 method further includes directing the subject through the breath collection process using the communication element.

21. The method of claim 19, further including the step of cleaning the breath sample reservoir chamber.

22. The method of claim 21, wherein the breath sample reservoir is cleaned with

20 nitrogen gas.

23. A method of automatically collecting breath samples from a subject comprising the steps of;

directing a subject to exhale into the breath collection device through a breath inlet via a communication element in the breath collection device;

capturing the breath sample in a breath sample reservoir;

conveying the breath sample from the reservoir to a breath sample collection

5 vessel; and

cleaning the breath sample reservoir chamber.

24. A system for collecting samples of breath comprising:

a device including;

a breath inlet adapted to be connected to a breath collection vessel; and

10 a microprocessor; and

a cartridge releasably insertable into the device and adapted to hold the breath collection vessel.

25. The system of claim 24, wherein a valve is associated with the breath inlet and the breath collection vessel.

15 26. The system of claim 25, wherein the microprocessor controls the operation of the valve.

27. The system of claim 24, wherein the cartridge comprises a code that is positioned with respect to the cartridge so that when the cartridge is inserted into the device, a desired program stored in the microprocessor is initiated and opens the valve
20 at specified time intervals.

28 The system of claim 24, wherein the device further includes a communication element that emits audible instructions to a user of the device.

29. A cartridge for housing breath collection vessels comprising:

a frame releasably insertable into a breath collection device, the frame adaptable to secure a breath collection vessel; and

a code positioned on the cartridge so that when the cartridge is inserted into the device, one of a plurality of programs stored in a microprocessor of the device is chosen
5 and activated when the code is read by a code reading element.

30. The cartridge of claim 29, wherein the code comprises a bar code.

31. The cartridge of claim 29, wherein the code comprises holes formed in the cartridge frame.

32. The cartridge of claim 29, wherein the frame secures a plurality of breath

10 collection vessels.